REMARKS

Claims 1 – 57 are pending. As discussed below, the claims are in condition for allowance.

Provisional Rejection of Claims 1-5, 11, 16 and 22 Under Double Patenting Obvious-Type

This provisional rejection of the Claims 1-5, 11,16 and 22 is noted and applicant requests deferral of the matter until the action is made un-provisional in accordance with MPEP §822. At that time applicant will submit arguments regarding the propriety of the rejection or take other action such as filing a terminal disclaimer.

Claim 1 is rejected under §103(a) as being unpatentable over Sacks et al. (US 6,161,505) in view of Tuttle et al. (6,108,151)

As discussed below, the Applicant's attorney respectfully disagrees with this rejection.

Claim 1 recites a servo circuit, comprising a servo channel operable to recover servo data from servo wedges that identify respective data sectors on a data-storage disk; and a processor coupled to the servo channel and operable to detect one of the servo wedges while the disk is attaining or after the disk attains an operating speed but before the servo channel recovers any servo data.

Sacks et al. '505 discloses a controller 102 for producing a tracking or position error (PES) during read-write. See for example Col. 4, lines 37-43, and Col. 7, lines 8-25. As noted by the Examiner Sacks et al. further discloses in Col. 6 lines 3-26 a servo channel and processor but fails to teach a processor operable to detect one of the servo wedges during or after disk spin-up without first detecting a spin-up wedge. Sacks et al. does disclose that "leading" and "middle" fields 320, 322 and 324 of Fig 3 contain sync, phase, track and sector numbers, but there is no teaching

of how these data are used to find the circumferential head position initially such as during spin-up. The teaching in Sacks et al. is primarily concerned with the radial tracking error (PES) using offset bursts of position error field 126 for head position correction during normal read write operations after spin-up.

Tuttle el al. '151 discloses a disk servo system that uses a spin-up dc erase wedge field to find a servo data wedge location and from which the servo wedge and wedge sector data are identified. Referring for example to Col. 15, lines 19-30 the '151 patent cannot locate the servo wedge during "initial positioning of a read-write head—" without first detecting a predetermined seqence of disk recorded bit "normally a long sequence of "0" bits". Such a "0" bit sequence is also known in this art as a dc erase field in which no magnet transitions occur which might be mistaken for data or other control information. See Applicant's specification Paragraph 76. Therefore Tuttle el al. '151 does not disclose a "servo wedge" that identifies a sector in an "initial positioning". In comparison applicant for example discloses a servo circuit 30 of Fig 5 that detects the presence of a first servo wedge by a positive detection of the preamble of such servo wedge (Paragraphs 35-36) using for example the clock sampling and summing process of a sinusoidal wave read from the preamble bit sequence shown in Figure 7 (Paragraphs 37-39). The detection of the servo wedge in this manner allows the storage disk to have no or few dc erase spin-up fields that if present take up disk storage space.

The Examiner proposes to use the teaching in Tuttle et al. '151 to modify Sacks et al. with regard to Applicant's Claim 1. However, as discussed above Tuttle et al. discloses initial positioning using a zero frequency or sequence of "0" bits, sometimes called a dc erase field detected during spin-up to initially find a sector wedge. Tuttle el al. '151 also discloses offset radial tracking bursts of a servo control described for example beginning at Col. 15, line 64 through Col. 16 and continuing which are to be

compared to to the offset burst of position error field 126 in Sacks et al. Thus Tuttle et al '151 does not teach or suggest a modifcation of Sacks et al that would lead to Applicant's Claim 1 and Claim 1 is submitted as patentable.

The Office Action appears to reject Claim 38 on the same above grounds as Claim 1. Applicant respectfully disagrees.

Claim 38 recites a method, comprising rotating a data-storage disk having a surface from a first rotational speed to a second rotational speed over a first time period, the cirumferential position of a read head relative to a location of the disk surface being unknown for a portion of the first time period; during or after the first time period and while the circumferential position of the read head is unknown, detecting servo data that identifies application data stored on the data-storage disk; and

determining the circumferential position of the read head from the detected servo data.

For the reasons given above it would not be obvious to modify Sacks et al. using the Tuttle et al. as proposed in the Office Action because Tuttle et al. initially finds application data from detection of a dc erase spin-up field not from servo data. Thus Claim 38 is patentable as any apparent modification of Sacks et al in view of Tuttle et al would still require determining the read head position from the dc erase field of Tuttle et al not from detection of servo data and thus would not satisfy the claimed method.

Claim 22 is likewise submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 2 and 23 are submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 3 and 24 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the following further reasons. Claim 3 recites the one servo wedge comprises a preamble; and the processor is operable to detect the one servo wedge by detecting the preamble. Tuttle et al. does not detect the preamble in the disclosed system but rather finds a spin-up dc erase field and then synchronizes to a following preamble. See Tuttle et al. '151 Col. 15, lines 19-30. Therefore the recitations of these claims would not be met even if Tuttle et al. were used to modify Sacks et al.

Claims 4 and 25 are submitted as patentable for the reasons given in support of Claims 1 and 38.

Claim 5 is submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 10 and 29 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further reasons that Tuttle et al. does not disclose detecting the preamble of one servo wedge and employing an interpolator loop to acquire samples of the read signal while the processor is detecting the preamble and beginning tracking the timing of the samples a predetermined time after the processor detects preamble of the one servo wedge. For example see the interpolation loop operation of processor 40 in Applicants specification Paragraph 50. The Examiners citation of Tuttle et al. Col. 21, lines 3-31 concerns the asynchronous demodulation of servo burst fields for tracking error correction and not to the collection of timing from the preamble of the one servo wedge after a predetermined time and while the processor is still detecting the preamble of the same one servo wedge. Claims 10 and 29 are thus patentable over the Tuttle et al. and Sacks et al. teachings for these further reasons.

Claims 13 and 31 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further grounds that Tuttle et al. and Sacks et al. do not teach a processor that detects the preamble if and only if a predetermined number

of consecutive samples represent the preamble. See for example Applicant's paragraph 50. Tuttle et al. starts to acquire the timing phase of the preamble after spin-up dc erase wedge is detected but there is no corresponding positive detection of the preamble as called for in Claims 13 and 31. From Tuttle el al. and Sacks et al. it is not obvious how many samples of a preamble give a positive detection of its presence. Thus any modification of Sacks et al. using Tuttle et al. would fail to meet the recitations of Claims 13 and 31 and they are patentable.

Claims 14 and 54 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further reasons that are stated above in support of Claims 10 and 29.

Claims 15, 33 and 55 are submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 16, 17, 18, 34, 35, and 56 are submitted as patentable for the reasons given in support of Claims 1 and 38.

Claim 32 is submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further reasons that are stated above in support of Claims 10 and 29.

Claims 39 and 40 are submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 41, 42 and 44 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further reasons that in each of these claims the circumferential positon of the read head is unknown during the detection of the servo data, for example the preamble. In Tuttle et al. the disclosed method is to find a circumferential positon, that is a location of a servo wedge, by detection of the dc erase field so that the servo address data can be recovered after synchronizing to the preamble, thereby confirming the sector address and hence circumferential location of the head. See Tuttle et al. '151 Col. 15, lines 19-23. Thus it is not

obvious to modify Sacks et al. in view of Tuttle et al. as the resulting modifed system would know the circumferential position from recovery of sector address data following detection of the dc erase field.

Claim 43 is submitted as patentable for the reasons given in support of Claims 1 and 38.

Claims 45 and 46 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the further reasons that the detecting of a predetermined number of servo wedges is required before the circumferential positon of the read head is determined (for robustness) is not taught or suggested buy Tuttle et al.s use of a dc erase mark for one wedge to aid in locating other servo wedges and recovery of other sector addresses. In the context of Claims 45 and 46 which do not rely on dc erase fields for circumferential locating of the read head, the requirement of more than one servo wedge data identifiers greatly enhances the reliability without needing detection of dc erase and is not suggested by the prior art such Tuttle et al.

Claim 51 is submitted as patentable for the reasons given in support of Claims 1 and 38 and for the following further reasons. The Office Action cites Tuttle et al. Col 22, lines 5-55 in regard to the claimed step of interpolating values of the samples, but the referenced Tuttle et al. disclosure concerns processing of servo bursts for tracking and does not pertain to reading of the sampled servo data that indentifies track and sector head position. As such this Tuttle et al. disclosure does not suggest any meaningful modification of Sacks et al. leading to the method of claim 51.

Claim 53 is submitted as patentable for the reasons given in support of Claims 1 and 38 and for the reasons in support of Claims 13 and 31.

Claims 19, 20 and 36, 37 are submitted as patentable for the reasons given in support of Claims 1 and 38 and for the following further reasons. Patapoutian et al. (US 5,661,760) and Cloke et al. (US 5,822,141) while disclosing Viterbi detectors in disk drive servo channels do not suggest modifications of Sacks et al and Tuttle et

al. that would result in the claimed combinations. For example Patapoutian et al. discloses a system that uses a dc erase 731 preceding the servo preamble and is similar to Tuttle et al. in this respect. See Patapoutian et al. Col. 6, lines 47-61. Cloke et al. has no disclosure of a processor for detecting the presence of the servo wedges before the servo channel recovers any servo data and therefore does not suggest any modification of Sacks et al. and Tuttle et al. that satisfies these claims.

Claim 21 is submitted as patentable for the reasons given in support of Claim 1 and for the following further reasons. Sacks et al. and Tuttle et al. are discussed above. Ehrlich et al (6,519,107) **discloses a storage drive system for servo writing reference patterns on a disk under clean room conditions and then self-writing additional patterns on the same disk using the reference patterns as masters, in order to improve manufacturing efficiency. There is no statement in Ehrich et al. that the clean room or final self written servo patterns lack spin-up wedges, that is transitionless erase fields. Ehrlich et al. are primarily concerned with expediting production of disk drives by servo writing and then self writing off-set servo burst patterns used for centering the read-write heads on the circumferential tracks. They do disclose that "phase coherent servo fields including track number information may also be included within the (initial) reference servo patterns and the final (self written) product servo patterns". Col. 6 lines 65-67; Col. 12, lines 18-21, 50-51; and Col. 14, lines 37-54.**

For example, in Col. 14, beginning at line 38 Ehrlich et al states that the digital servo information 23 includes for example a sync field, a servo address mark field which may include a once per revolution fiducial location, a track number field and a servo number field. There is no express statement of an erase or transitionless field used on spin-up. However because Ehrlich et al. is primarily concerned with the tracking servo bursts 22, the brief mention of the servo address mark field does suggest a dc erase marker in information 23 for locating the servo wedge sync field as that is the current prevalent practice.

In any case there is no teaching by Ehrlich et al. of the intentional omission of spin-up fields, e.g. dc erase, as a design requirement. Indeed many of the documented systems in this art area cited in the file: e.g. Tuttle et al., Leis et al., and Patapoutian et al. (US 5,661,760) expressly disclose the need of a dc erase spin-up wedge. The Office Action cites Ehrlich et al. Col. 14, lines 20-33 as support for the assertion that their system has no erase field for finding a servo wedge. However Col. 14, lines 20-23 only state that "no attempt is made to DC erase the burst edges in order to trim or adjust burst widths" as apparently Ehrlich et al. found the "untrimmed" servo bursts are preferred for radial tracking. This has no bearing on the teaching and claims 7 and 28 of Applicant. Whether trimmed or "untrimmed" the bursts of Ehrlich et al. are not used for initially locating sector and track identifications and the use of the words DC erase in the context of Col. 14, line 23 in Ehrlich et al is a superficial, irrelevant coincidence. The Ehrlich et al. DC erase context referring to the untrimmed tracking bursts does not teach or suggest the omission of a spin-up dc erase in the context of Applicant's claims 7 and 28 and these claims are patentable over the teachings of Tuttle et al., Sacks et al. and Ehrlich et al.

CONCLUSION

Claims 1-57 are in the case.

Claims 6, 7, 8, 9, 11, 12, 26, 27, 28, 30, 47, 48, 49, 50, and 52 have been indicated as having allowable subject matter would be allowed if rewritten in independent form.

In light of the foregoing remarks, claims 1-57 are in condition for full allowance, and that action is respectfully requested.

In the event additional fees are due as a result of this amendment, you are hereby authorized to charge such payment to Deposit Account No. 50-1078.

If the Examiner believes that a phone interview would be helpful, then it is respectfully requested that Applicants' attorney, Bryan Santarelli be contacted at (425) 455-5575.

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Respectfully submitted,

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